

In re United States Patent Application of:)	Docket No.:	4240-145
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Applicants:	PAEK, Nam-Chon, et al.)	Conf. No.:	1925
)		
Application No.:	10/587,312)	Art Unit:	1638
)		
Date Filed:	July 26, 2006)	Examiner:	Russell Kallis
)		
Title:	A NOVEL STAY-GREEN GENE AND METHOD FOR PREPARING STAY-GREEN TRANSGENIC PLANTS)	Customer No.:	
)		23448
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I hereby certify that this document is being filed via EFS in the United States Patent and Trademark Office on April 23, 2009.
/kelly k. reynolds/

Mail Stop Amendment
Commissioner for Patents
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This responds to the March 23, 2009 Office Action in the above-identified application. The time for responding to the March 23, 2009 Office Action without extension was set at one month, or April 23, 2009. This Response is therefore timely.

- **Group I**, claims 1-4 and 6-8, drawn to an *SGR* gene encoding a polypeptide;

- **Group II**, claim 5, drawn to an SGR polypeptide;
- **Group III**, claims 9-16, drawn to a method of producing a stay green mutant plant by mutating the *SGR* gene, and plant thereby;
- **Group IV**, claims 17-30, drawn to a method of producing a stay green mutant plant comprising suppressing expression of the *SGR* gene, and plant thereby; and
- **Group V**, claims 31-35, drawn to a method of producing a stay green mutant plant by inactivating the *SGR* protein.

Applicants elect, with traverse, Group I, consisting of claims 1-4 and 6-8, drawn to an *SGR* gene encoding a polypeptide.

Additionally the examiner has further required an election among SEQ ID NOs: 1 to 21 and 28 to nucleic acids and/or among SEQ ID NOs: 30 to 50 and 57, the corresponding amino acids. The election of a single SEQ ID NO is noted by the examiner as not a species election requirement, but an invention election requirement.

Furthermore, applicants elect a single nucleic acid sequence of SEQ ID NO: 1, with traverse.

Traversal of Rejection

The above elections are made by applicants with traverse. The examiner's attention is respectfully directed to MPEP § 1850 and PCT Rules 13.1 and 13.2 which form the basis for applicants' traversal:

"[t]he international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ('requirement of unity of invention')" (Rule 13.1)

"[w]here a group of inventions is claimed in one and the same international application, the requirement of unity of invention referred to in Rule 13.1 shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression 'special technical features' shall mean those **technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.**" (Rule 13.2; emphasis added)

The restriction is traversed under Rules 13.1 and 13.2 as the members of the Group are so linked as to form a general inventive concept and there exist common special technical features which define the contribution the claimed members of each Group make over the prior art.

The examiner has required two separate elections. First, restriction was required among Groups I-V, as set out above. Second, restriction was required among SEQ ID NOs: 1 to 21 and 28 to nucleic acids and/or among SEQ ID NOs: 30 to 50 and 57, the corresponding amino acids. The election of a single SEQ ID NO is noted to not be a species requirement.

With regard to election among Groups I-V, applicants respectfully traverse the requirement, based on the single general inventive concept of these Groups. Specifically, the genes of Group I encode the polypeptides of Group II, all previously undiscovered, as detailed above. Groups III, IV and V all recite a method of producing a stay green plant by alteration of the genes of Group I by mutation (Group III), suppression of expression (Group IV) or inactivation (Group V). Groups III, IV and V are therefore methods of using the gene of Group I. All Groups are therefore related by the special technical feature of a gene encoding a discovered *SGR* sequence so as to form a single general inventive concept.

With regard to the restriction among the sequence identifiers, the members of each of the Groups identified as 1) nucleic acid sequences (SEQ ID NOs: 1 to 21 and 28) and 2) polypeptides (SEQ ID NOs: 30 to 50 and 57), possess a technical relationship including special technical features, so as to form a single general inventive concept.

As described in the specification, all of SEQ ID NOs: 1 to 21 and 28 are STAY GREEN (*SGR*) genes and have the common technical features of encoding a protein which expresses a protein that participates in the catabolism of chlorophyll and results in leaf yellowing but when that protein expression is suppressed by gene mutation or protein deactivation, the plant leaves retain their green color during leaf senescence. While many of SEQ ID NOs: 1 to 21 and 28 are from different organisms, all are *SGR* genes. As provided in the specification, prior to the present invention "...the sequence of the wild type *SGR* gene and the *sgr* mutant gene, and the amino acid sequence and the function of the *SGR* protein encoded by the *SGR* gene have not yet been revealed." (Specification, p. 4, ll. 12-14.) Applicants identified such sequences.

All of SEQ ID NOs: 1 to 21 and 28 possess a technical relationship and should be included as a single Group. If election is required among the gene sequences, applicants submit that such should be a species election. All members of the group identified as *SGR* genes are genes that are related in that they encode proteins that participate in chlorophyll catabolism during leaf senescence and all are related in effecting leaf yellowing. Considered as a whole, the previously unknown sequences of these genes define a contribution over the prior art.

Similarly, all of SEQ ID NOs: 30 to 50 and 57 possess a technical relationship and should be included as a single Group. If election is required among the polypeptide sequences, applicants submit that such should be a species election. All members of the group identified as *SGR* amino acid sequences are polypeptides that are related in that they participate in chlorophyll catabolism during leaf senescence and all are related in effecting leaf yellowing. Furthermore, as is seen throughout the application, the amino acid sequences of the invention have at least 60% homology with *SGR* domain I (residues 49~207 of SEQ ID NO: 30). Considered as a whole, the previously unknown sequences of these polypeptides define a contribution over the prior art.

In order that this response fairly meets the substance of the Office Action in all respects, even though the election requirement is traversed by Applicants, a single disclosed nucleic acid sequence of SEQ ID NO: 1 is hereby elected, subject to the foregoing traversal. While the examiner characterizes such as a restriction among inventions, it is applicants' position that such is a restriction among species of *SGR* genes.

It is understood that in a species election, if any species is found to be allowable, that an additional species will be examined, until all species have been examined. i.e., all *SGR* genes or all *SGR* polypeptides. If any generic claim is finally held to be allowable, all claims drawn to species containing all elements of the generic claim will also generally be held to be allowable. (MPEP § 806.04(d)).

Rejoinder

In the event that the restriction requirement between the composition and method aspects of the invention is made final, Applicants responsively request rejoinder of method claims 9-35 under the provisions of MPEP §821.04 upon confirmation of allowable subject matter of the composition claims 1-4 and 6-8.

Such rejoinder would be fully proper under these circumstances¹.

In the present application the elected claims 1-4 and 6-8 are directed to an *SGR* gene encoding a polypeptide. Claims 9-35 are directed to methods for using such gene in producing a stay green plant by alteration of the genes of Group I by mutation (Group III), suppression of expression (Group IV) or inactivation (Group V). Consistent with the provisions of the MPEP §821.04, when the product claims 1-4 and 6-8 are subsequently found allowable, any withdrawn method of using the subject of claims of 1-4 and 6-8, as recited in Groups III, IV and V would be properly rejoined for examination.

CONCLUSION

In response to the Requirement for Restriction dated July 31, 2006, Applicants have provisionally elected, with traverse, Group I, claims 1-4 and 6-8, drawn to an *SGR* gene encoding a polypeptide, and have further provisionally elected SEQ ID NO: 1 as a particular *SGR* gene, with traversal of the election requirement.

The examiner correspondingly is requested to reconsider the election requirements in light of the foregoing remarks.

This responds to the March 23, 2009 Office Action in the above-identified application. The time for responding to the March 23, 2009 Office Action without extension was set at one month, or April 23, 2009. This Response is therefore timely and no fees are believed to be due for the filing of this paper. However, should any fees be required or an overpayment of fees made, please debit or credit our Deposit Account No. 08-3284, as necessary.

¹ When an application as originally filed discloses a product and the process for making and/or using such product, and only the claims directed to the product are presented for examination, when a product claim is found allowable, Applicants may present claims directed to the process of making and/or using the patentable product for examination through the rejoinder procedure in accordance with MPEP §821.04, provided that the process claims depend from or include all the limitations of the allowed product claims.

If any additional issues remain, the Examiner is requested to contact the undersigned attorneys at (919)419-9350 to discuss same, in order that the prosecution of this application is expedited.

Respectfully submitted,

Date: April 23, 2009

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